

### REMARKS

Applicants respectfully request a three-month extension of time for filing the response to the subject Office action and submit herewith payment of the requisite fee for same. The Commissioner is hereby authorized to charge any additional fees that may be required to Deposit Account No. 19-1345.

Claims 1, 23 and 24 are amended herein. Claims 25-33, which were withdrawn by the Examiner, are canceled. Upon entry of this amendment, claims 1-24 and 34 remain pending.

#### Claim 24

Applicant requests reconsideration of the rejection of claim 24 as being unpatentable over Canadian Patent 2,035,512 (CA '512) in view of German Patent 4,102,167 (DE '167). Claim 24 recites a waste gas treatment system using biological treatment technology comprising: a dust and grease filtering device for filtering waste gas; a directional gas flow device having a valve, a gas inlet and at least two gas outlets, the gas inlet being connected to the filtering device, the valve being adapted to control the waste gas to flow toward one of the gas outlets; and a biological treatment system including a top, a bottom and a biological reactor, the top and bottom of the biological treatment system being connected to the outlets of the directional gas flow device, respectively; the biological reactor being in association with one another and a microorganism contained therein is adapted to be immobilized on support material.

CA '512 discloses a system comprising a directional valve (2) having one inlet and two outlets. Further, CA '512 discloses a percolation system (3) having a surface colonized by microorganisms. As pointed out in the Office action, CA '512 does not disclose a dust/grease filter device. DE '167 was cited as an example of providing a dust filter on the inlet.

The claim has been amended to clarify that the filter device filters both dust and grease. DE '167 does not disclose or suggest a grease filter. Thus, even if one were to combine the references, the combination would not suggest

each claim requirement. Accordingly, the rejection is improper and the Section 103 rejection should be withdrawn.

Claims 1-7, 10-18 and 22

Applicant requests reconsideration of the rejection of claims 1-7, 10-18, 22 and 23 as being unpatentable over CA '512 in view of DE '167 in further view of U.S. Patent 4,421,534 (Walker).

Each of the claims recites a waste gas treatment system comprising: a dust and grease filtering device; a directional gas flow device having a valve, a gas inlet and at least two gas outlets, the gas inlet being connected to the filtering device, the valve being adapted to control the waste gas to flow toward one of the gas outlets; a biological treatment system including a top, a bottom and a biological reactor, the top and bottom of the biological treatment system being connected to the outlets of the directional gas flow device, respectively; the biological reactor being in association with one another and a microorganism contained therein is adapted to be immobilized onto support material, wherein the microorganism is selected from the group consisting of Escherichia coli, Desulfovibrio desulfuricans, Gordonia terrae, Proteus vulgaris, Geobacter sulfurreducens, Clostridium butyricum, Bacillus subtilis, Clostridium beijerinckii, Rhodospirillum rubrum, Acidithiobacillus ferrooxidans, Pseudomonas putida, Arthrobacter oxydans, Cellulosimicrobium cellulans, Paracoccus denitrificans, Thiobacillus sp., Ochrobactrum sp., Citrobacter sp., Pseudomonas sp., Arthrobacter sp., Paenibacillus sp., Microbacterium sp., Stenotrophomonas sp., Lactobacillus sp., Acetobacter sp., Arthrobacter sp., Bacillus sp., Cellulomonas sp., Clostridium sp., Klebsiella sp., Lactobacillus sp., Leuconostoc sp., Nitrobacter sp., Rhizobium sp., Streptococcus sp., Streptomyces sp., Thermoactinomyces sp., Thermomonospora sp., Thermopolyspora sp., Aspergillus sp., and Thermomyces sp.; and a bioaerosol removal device connected to the biological treatment system.

As discussed above, CA '512 discloses a system comprising a directional valve and a percolation system having a surface colonized by microorganisms.

The Office action fails to specify what type of microorganism is used. Further, CA '512 does not disclose a dust/grease filter device. DE '167 was cited as an example of providing a dust filter on the inlet. Walker discloses an aqueous solution sprayed from manifolds 16, 17 onto media layers 32, 42, respectively, as the waste gas passes.

None of the references disclose or suggest a dust and grease filter device, nor a microorganism selected from the group consisting of the long list of microorganisms set forth in amended claim 1. The combined references also fail to disclose or suggest these features. Accordingly, a *prima facie* case of obviousness has not been made and the Section 103 rejection should be withdrawn.

#### Claim 23

Applicant requests reconsideration of the rejection of claim 23 as being unpatentable over CA '512 in view of DE '167 in further view of Walker.

Claim 23 recites a waste gas treatment system comprising: a dust and grease filtering device for filtering waste gas; a biological treatment system connected to the filtering device, the biological treatment system including at least one biological reactor in association with one another and a microorganism contained therein adapted to be immobilized onto support material; and a bioaerosol removal device connected to the biological treatment system.

As discussed above, none of the references disclose or suggest a dust and grease filter device. The combined references also fail to disclose or suggest these features. Accordingly, a *prima facie* case of obviousness has not been made and the Section 103 rejection should be withdrawn.

#### Claim 8

Applicant requests reconsideration of the rejection of claim 8 as being unpatentable over CA '512 in view of DE '167 in further view Walker and in still

further view of Japanese Publication 2-31816 (JP '816).

As an initial matter, the combination of four references speaks to the non-obviousness of the claimed device.

The claim recites a waste gas treatment system comprising: a dust and grease filtering device; a directional gas flow device having a valve, a gas inlet and at least two gas outlets, the gas inlet being connected to the filtering device, the valve being adapted to control the waste gas to flow toward one of the gas outlets; a biological treatment system including a top, a bottom and a biological reactor, the top and bottom of the biological treatment system being connected to the outlets of the directional gas flow device, respectively; the biological reactor being in association with one another and a microorganism contained therein is adapted to be immobilized onto support material, wherein the microorganism is selected from the group consisting of Escherichia coli, Desulfovibrio desulfuricans, Gordonia terrae, Proteus vulgaris, Geobacter sulfurreducens, Clostridium butyricum, Bacillus subtilis, Clostridium beijerinckii, Rhodospirillum rubrum, Acidithiobacillus ferrooxidans, Pseudomonas putida, Arthrobacter oxydans, Cellulosimicrobium cellulans, Paracoccus denitrificans, Thiobacillus sp., Ochrobactrum sp., Citrobacter sp., Pseudomonas sp., Arthrobacter sp., Paenibacillus sp., Microbacterium sp., Stenotrophomonas sp., Lactobacillus sp., Acetobacter sp., Arthrobacter sp., Bacillus sp., Cellulomonas sp., Clostridium sp., Klebsiella sp., Lactobacillus sp., Leuconostoc sp., Nitrobacter sp., Rhizobium sp., Streptococcus sp., Streptomyces sp., Thermoactinomyces sp., Thermomonospora sp., Thermopolyspora sp., Aspergillus sp., and Thermomyces sp.; and a bioaerosol removal device connected to the biological treatment system.

As discussed previously, the first three references fail to disclose or suggest the elements highlighted above. JP '816 was cited as showing a heat source. Thus, none of the references disclose or suggest a dust and grease filter device or a microorganism selected from the long list set forth above. The combined references also fail to disclose or suggest these features. Accordingly, a *prima facie* case of obviousness has not been

made and the Section 103 rejection should be withdrawn.

#### Claim 9

Applicant requests reconsideration of the rejection of claim 9 as being unpatentable over CA '512 in view of DE '167 in further view Walker in still further view of Japanese Publication 2002-224207 (JP '207).

That the rejection is made over a combination of four references speaks to the non-obviousness of the claimed device.

The claim recites a waste gas treatment system comprising: a dust and grease filtering device; a directional gas flow device having a valve, a gas inlet and at least two gas outlets, the gas inlet being connected to the filtering device, the valve being adapted to control the waste gas to flow toward one of the gas outlets; a biological treatment system including a top, a bottom and a biological reactor, the top and bottom of the biological treatment system being connected to the outlets of the directional gas flow device, respectively; the biological reactor being in association with one another and a microorganism contained therein is adapted to be immobilized onto support material, wherein the microorganism is selected from the group consisting of Escherichia coli, Desulfovibrio desulfuricans, Gordonia terrae, Proteus vulgaris, Geobacter sulfurreducens, Clostridium butyricum, Bacillus subtilis, Clostridium beijerinckii, Rhodospirillum rubrum, Acidithiobacillus ferrooxidans, Pseudomonas putida, Arthrobacter oxydans, Cellulosimicrobium cellulans, Paracoccus denitrificans, Thiobacillus sp., Ochrobactrum sp., Citrobacter sp., Pseudomonas sp., Arthrobacter sp., Paenibacillus sp., Microbacterium sp., Stenotrophomonas sp., Lactobacillus sp., Acetobacter sp., Arthrobacter sp., Bacillus sp., Cellulomonas sp., Clostridium sp., Klebsiella sp., Lactobacillus sp., Leuconostoc sp., Nitrobacter sp., Rhizobium sp., Streptococcus sp., Streptomyces sp., Thermoactinomyces sp., Thermomonospora sp., Thermopolyspora sp., Aspergillus sp., and Thermomyces sp.; and a bioaerosol removal device connected to the biological treatment system.

As discussed above with respect to claim 1, the first three references fail

to disclose or suggest the features highlighted directly above. JP '207 is cited as disclosing an ultraviolet source. Accordingly, none of the references disclose or suggest a dust and grease filter device or a microorganism selected from the long list set forth above. As a result, the combined references also fail to disclose or suggest these features. Because the Office action fails to make a *prima facie* case, the Section 103 rejection should be withdrawn.

#### Claims 19-21

Applicant requests reconsideration of the rejection of claims 19-21 as being unpatentable over CA '512 in view of DE '167 in further view Walker and in still further view of Canadian Patent 2,186,202 (CA '202).

The need for the Office to rely on four references provides evidence that the claimed device is non-obvious.

Each of the claims recites a waste gas treatment system comprising: a dust and grease filtering device; a directional gas flow device having a valve, a gas inlet and at least two gas outlets, the gas inlet being connected to the filtering device, the valve being adapted to control the waste gas to flow toward one of the gas outlets; a biological treatment system including a top, a bottom and a biological reactor, the top and bottom of the biological treatment system being connected to the outlets of the directional gas flow device, respectively; the biological reactor being in association with one another and a microorganism contained therein is adapted to be immobilized onto support material, wherein the microorganism is selected from the group consisting of Escherichia coli, Desulfovibrio desulfuricans, Gordonia terrae, Proteus vulgaris, Geobacter sulfurreducens, Clostridium butyricum, Bacillus subtilis, Clostridium beijerinckii, Rhodospirillum rubrum, Acidithiobacillus ferrooxidans, Pseudomonas putida, Arthrobacter oxydans, Cellulosimicrobium cellulans, Paracoccus denitrificans, Thiobacillus sp., Ochrobactrum sp., Citrobacter sp., Pseudomonas sp., Arthrobacter sp., Paenibacillus sp., Microbacterium sp., Stenotrophomonas sp.,

Lactobacillus sp., Acetobacter sp., Arthrobacter sp., Bacillus sp., Cellulomonas sp., Clostridium sp., Klebsiella sp., Lactobacillus sp., Leuconostoc sp., Nitrobacter sp., Rhizobium sp., Streptococcus sp., Streptomyces sp., Thermoactinomyces sp., Thermomonospora sp., Thermopolyspora sp., Aspergillus sp., and Thermomyces sp.; and a bioaerosol removal device connected to the biological treatment system.

As discussed above with respect to claim 1, the first three references fail to disclose or suggest the features highlighted directly above. The Office states CA '202 shows immobilizing microorganisms on a support using encapsulation and/or crosslinking. None of the references disclose or suggest a dust and grease filter device or a microorganism selected from the long list set forth above. As a result, the combined references also fail to disclose or suggest these features. Because the Office action fails to make a *prima facie* case, the Section 103 rejection should be withdrawn.

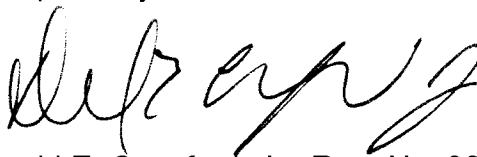
#### Claim 34

Claim 34 was not addressed with specificity in the Office action. If the Examiner wishes to make a rejection, Applicant requests he make it with specificity in a NON-FINAL Office action to provide Applicant an appropriate opportunity to reply in the first instance. Otherwise, Applicant requests the claim be identified as allowable. A final Office action would be premature.

Conclusion

As the application is believed to be in condition for allowance, a favorable action and Notice of Allowance are requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "D. Crawford, Jr.", written in a cursive style.

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